भारतीय मानक
Indian Standard

IS 326 (Part 26) : 2017

(Reaffirmed 2022)

प्राकृतिक और संश्लेषित सुगंध सामग्री के नमूने लेने और परीक्षण की पद्धतियाँ

भाग 26 प्रज्जवलन बिन्दु (फ्लैश प्वाइंट) ज्ञात करने की सामान्य मार्गदर्शिका

Methods of Sampling and Test for Natural and Synthetic Perfumery Material

Part 26 General Guidance on Determination of Flashpoint

ICS 71.100.60

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Fragrance and Flavour Ingredients Sectional Committee, PCD 18

FOREWORD

This Indian Standard (Part 26) was adopted by the Bureau of Indian Standards, after the draft finalized by the Fragrance and Flavour Ingredients Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Carriers, insurance companies, stock managers, etc, need to know the flashpoint of combustible essential oils to provide the necessary conditions to meet safety requirements for storage and transport. It was therefore decided to add information on the flashpoint to each Indian Standard on the specification of essential oils and to attempt to standardize a suitable test method for its determination.

A number of methods are available for determination of flashpoint. It is difficult to adopt a single method which could be applied to all essential oils, for the following reasons:

a) There are a large number of essential oils and their chemical composition varies greatly;
b) The recommended volume of sample for the use of certain apparatus (30 ml to 150 ml) is incompatible with the high price of certain essential oils;
c) Users cannot be forced to buy one type of equipment rather than another when there are several types in existence which respond perfectly well to the intended objectives; and
d) There already exist many references giving the flashpoint of certain essential oils with various types of apparatus.

In conclusion, it was felt impossible to standardize a single method, and therefore decided;

a) to provide a guide for the user enabling selection of the most appropriate apparatus and method for individual essential oil; and
b) to add an annex to all essential oil standards to give the mean flashpoint for information, stating the determination method wherever possible.

Considerable assistance has been drawn from ISO/TR 11018 : 1997 'Essential oils – General guidance on determination of flashpoint' in the formulation of this standard.

In reporting the results of a test or analysis made In accordance with this standard, if the final value, observed or calculated, is to be rounded of, it shall be done in accordance with IS 2 : 1960 'Rules for rounding of numerical values (*revised*)'.

Indian Standard

METHODS OF SAMPLING AND TEST FOR NATURAL AND SYNTHETIC PERFUMERY MATERIAL

PART 26 GENERAL GUIDANCE ON DETERMINATION OF FLASHPOINT

1 SCOPE

This standard provides general guidance on methods that can be used for the determination of flashpoint, together with information on their respective fields of application.

It is intended for use by test laboratories and organizations responsible for monitoring safety conditions during the transport and/or storage of essential oils.

2 REFERENCES

The standards listed below contain provisions which, through reference in text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards indicated below:

IS No.	*Title*
1448	Methods of test for petroleum and its products
(Part 20) : 1998	Determination of flash point by Abel apparatus (*second revision*)
(Part 21) : 2012/ ISO 2719 : 2002	Determination of flash point — Pensky-Martens closed cup method (*third revision*)
326 (Part 23) : 2017/ISO 356 : 1996	Methods of sampling and test for natural and synthetic perfumery materials Part 23 Preparation of test samples
ISO 1516 : 2002	Determination of flash/no flash — Closed cup equilibrium method
ISO 1523 : 2002	Determination of flash point — Closed cup equilibrium method
ISO 3679 : 2004	Determination of flash point — Rapid equilibrium closed cup method
ISO 3680 : 2004	Determination of flash/no flash — Rapid equilibrium closed cup method

3 GENERAL CONSIDERATIONS ON METHODS FOR MEASURING

3.1 General

Several of overlap with regard to their field of application and are, in general connected with the use of methods and measuring cups known as: Abel, Abel-Pensky, Pensky-Martens, Tag, Setaflash and Luchaire. It should be noted that methods using equipment of the Setaflash type described in ISO 3679 and ISO 3680 have the obvious advantage of using a small amount of the product.

There are also international regulations given in ISO 1523 and ISO 1516 describing a general method connected with the restrictive use of the cups mentioned above.

4 DIFFERENCES BETWEEN THE TYPES OF APPARATUS

In practice, the following types of apparatus are available for determination of flash point:

a) *Abel or Abel-Pensky apparatus* — Measurement without agitation, valid for temperatures below 65°C;

b) *Pensky-Martens apparatus* — Measurement with agitation, valid for temperatures greater than 50°C;

c) *Setaflash type apparatus* — Measurement without agitation, valid between ambient temperature and 110°C;

d) *Luchaire type apparatus* — Measurement without agitation, valid between ambient temperature and 150°C.

5 SAMPLE PREPARATION

See IS 326 (Part 23) : 2017.

6 TEST METHOD

Follow the test method given in Annex A and the instructions of the manufacturer of the apparatus.

7 TEST REPORT

The test report shall state the method used and the results obtained. It shall in addition mention all operating details not specified or regarded as optional, together with any events likely to have had an effect on the results.

The test report shall give all information necessary for the full identification of the sample.

ANNEX A

(*Clause* 6)

METHOD FOR DETERMINATION OF FLASH POINT

A-1 METHOD

A-1.1 Introduction

It is useful, when carrying out this test, to have preliminary information on the flammability of the substance. The procedure is applicable to liquid substances, in their commercial form, the vapour from which can be ignited by ignition sources. The test methods described in this standard are valid only for the flashpoint ranges specified in the individual methods.

A-1.2 Definitions and Units

The flashpoint is the temperature, corrected for a pressure of 101.3 kPa, at which the test vapour in a closed vessel, under the test conditions forms a flammable mixture of vapour and air in the test vessel.

Unit : °C

$t = T - 273.15$

where t in °C and T in K.

A-1.3 Reference Substances

When examining new substances, reference substances should be used in all cases. They are used mainly for periodic calibration of the method and to permit a comparison of the results where another method is applied.

A-1.4 Principle of the Method

The substance is placed in a test vessel which is heated gradually until the concentration of vapour in the air produces a mixture which can be ignited.

A-1.5 Quality Criteria

A-1.5.1 *Reproducibility*

Reproducibility depends on the flashpoint range and test method used; *Max*: ± 2°C.

A-1.5.2 *Sensitivity*

Sensitivity depends on the test method used**.**

A-1.5.3 *Specificity*

The specificity of certain test method is limited to certain flashpoint ranges and depends on the data relating to the substance (for example, high viscosity).

A-1.6 Description of the Method

A-1.6.1 *Preparation*

A sample of the test substance is placed in a test apparatus as described in **A-1.6.3.1** and/or **A-1.6.3.2**.

A-1.6.2 *Test Conditions*

The apparatus shall preferably be installed away from draughts.

A-1.6.3 *Test Procedure*

A-1.6.3.1 *Equilibrium method*

See ISO 1516, ISO 1523, ISO 3679 *and* ISO 3680

A-1.6.3.2 *Non-equilibrium method*

Abel apparatus [*see* IS 1448 (Part 20)].

Pensky-Martens apparatus [*see* IS 1448 (Part 21)].

Where the flashpoint determined by a method based on non-equilibrium (*see* **A-1.6.3.2**) has the following values: 0 ± 2°C, 21 ± 2°C, 55 ± 2°C, it should be confirmed by a method based on equilibrium using the same apparatus.

NOTES

1 Only methods capable of giving the temperature of the flashpoint may be used for notification.

2 For determining the flashpoint of viscous liquids (paints, gum, etc) containing solvents, only apparatus and test methods for determining the flashpoint of viscous liquids shall be used (*see* ISO 1523 and ISO 3679).

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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